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ABSTRACT

This paper describes the development of a predictive model to determine potential high school dropouts and identify areas for intensified assistance at the individual or group level. V. Tinto's (1975, 1987) model of college attrition was validated for use with high school students in rural, low socioeconomic areas of the Southeast. Ex post facto survey data were gathered from 331 high school seniors and dropouts from the senior cohort in three rural southeastern school districts. The CHAID (Chi Square Automatic Interaction Detector) procedure was used to perform segmentation modeling, dividing the sample into dropouts and persisters and then splitting each group into smaller and smaller subgroups that were mutually exclusive, significantly different with regard to an independent variable, and no smaller than 10 subjects. The CHAID model identified academic achievement as the most important determinant of persistence or dropout, and showed that students at different levels of academic achievement had unique identifying characteristics related to the dropout decision. Other findings were related to the effects on persistence of retention in grades 1-7, extracurricular participation, academic and social synthesis, sense of school membership, race, and gender. Further exploratory study of one of the districts (in Appalachia) highlighted the importance of mother's expectations for her child and mother's educational background. Contains 52 references. (SV)

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PRESENTATION OF SOCIAL AND ACADEMIC FACTORS THAT ENCOURAGE PERSISTENCE IN SECONDARY SCHOOLS IN RURAL, LOW SOCIOECONOMIC AREAS OF TWO SELECTED SOUTHEASTERN STATES

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PRESENTATION OF SOCIAL AND ACADEMIC FACTORS THAT ENCOURAGE PERSISTENCE IN SECONDARY SCHOOLS IN RURAL, LOW SOCIOECONOMIC AREAS OF TWO SELECTED SOUTHEASTERN STATES

The purpose of this study was the development of a predictive model to determine potential dropouts and to identify areas for intensified assistance at the individual or group levels. Tinto's model (1975, 1987) of college attrition was validated for use with high school students in rural, low socioeconomic areas of the southeastern United States. Ex post facto survey data were gathered from seniors and dropouts from the senior cohorts in three school districts. In an explanatory run of the model, the CHAID statistical procedure for segmentation modeling showed high school grades to be the most significant predictor with additional factors entering the model at segmented achievement levels. With the addition of cut points for the independent variables, a change in the dependent variable, and data gathered early in the students' school experiences, the model may serve as a predictor model for the dropout/persistence decision and provide guidance for dropout prevention programs.

Previous Research

In the literature after 1965, researchers concluded that persons from low socioeconomic backgrounds and minorities were overly represented in the dropout population (Bottoms & Presson, 1991; Ekstrom, Goertz, Pollack, & Rock, 1986; McMillen, Kaufman, & Whitener, 1994; Rumberger, 1987). This focus on the fixed attributes has been detrimental to educational reform and has hindered changing school policies and practices (Wehlage & Rutter, 1986). While many of the exogeneous variables are beyond the control of the school, other variables that contribute to the longitudinal process of dropping out of school have been identified and may be modified. Research has consistently shown that poor academic performance (lack of academic integration) and dislike of school (Lack of of social integration singularly or in combination with academic integration) are the primary reasons given by students for leaving school before graduation

(Ekstrom et al., 1986; Hahn, 1987; Wehlage, Rutter, Smith, Lesko, & Fernandez, 1989; White & Feldman, 1994).

Because of a scarcity of theoretical models addressing dropouts at the high school level, models that predict attrition at the college level have been used and modified for the secondary level. Tinto's model (1975, 1987) of college attrition has prompted that largest body of research at the collegiate level (Pascarella, Duby, & Iverson, 1983), and has been used in urban secondary schools and with data from the High School and Beyond national education study (Brady, 1985/1986; Finnan, 1991/1995; Miller, 1990/1991; Pittman, 1991). The rural, Southern setting is a previously unexplored context for this model although the South experiences the highest number of dropouts in the United States, 46% of the population in the South lives in rural areas, and the rural poverty level in these areas in 1986 was 50% higher than in urban areas. While the majority of the poor in rural areas are White, minorities are more severly affected by poverty in rural areas than in urban areas (Burea of Census, 1992a; Huang & Howley, 1991; O'Hare, 1988; Ooms, 1992; McMillen et al., 1994).

Tinto (1975, 1987) described the interactions of Family Background characteristics, Individual Attributes, and Early Education Experiences and theorized that the interactions among these factors determined the Goal and Institution commitment of the student and parents, and led to academic and social integration at the college level. Tinto viewed dropping out as a longitudinal process of interactions between student and school determined by the individual's perception of reality as constructed through earlier experiences.

Researchers have used the concepts of integration /alienation to express concern about the development of resilient at-risk students (McMillan & Reed, 1994) and to develop additional models of the process of dropping out (Finn, 1989). Additional literature is expressed in terms of resilience, affiliation, involvement, attachment, school membership, or bonding, or in negative terms of cultural conflict, alienation, and withdrawal (Beck & Muia, 1980; Finn, 1989; Fordham & Obgu, 1986; Goodenow, 1993; McMillan & Reed, 1994; Winfield, 1991).

Model Development

Using Tinto's model (1975, 1987) of college attrition as the theoretical framework for this study, metric and nonmetric independent variables from Tinto's conceptual schema and findings from later

literature were combined into a modified model in Figure 1 (Barrington & Hendricks, 1989; Barro & Kolstad, 1987; Bottoms & Presson, 1991; Ekstrom et al., 1986; Finn, 1989; Glickman, 1991; Pittman, 1991; Shepard & Smith, 1989; Slavin, Karweit, and Madden, 1989, 1992/1993). Variable measurements and labels are found in the appendix. These independent variables were introduced separately in the model to reduce compounding the findings as suggested by Terenzini and Pascarella (1980) and Tinto (1987). Both goal and institutional commitments were omitted because they were not considered to be relevant factors at the secondary level. Laws in every state mandate school attendance until a minimum of 16 years, and school district regulations determine the institution attended. The dependent variable (Drop_Out) divided the sample into persisters in school (0) or dropouts (1).

Population, Sample, and Setting

The target population in this study was defined as seniors who were to graduate in June, 1996 from public school districts in rural, low socioeconomic areas of the southeastern United States. This population included cohort dropouts who could be located to interview.

Because the researcher was unable to draw a random sample from such a widely spread population, an experimentally accessible population was chosen from two southeastern states. This cluster sample consisted of seniors in three selected public school districts and school dropouts from these cohorts. A major problem was locating an adequate number of dropouts to participate in the study. The research was undertaken with 339 subjects of whom 51 were dropouts (Table 1).

Table 1

School Districts, Seniors Surveyed, Percentage of Senior Class Survey, and Cohort Dropouts Surveyed

District	# Seniors Surveyed	% of Senior Class	# Dropouts Surveyed
I	149	70%	13
II	68	71%	33
III	71	82%	5

The sample from one state included two school districts that had an Appalachian population. District I

had two small high schools and a total elementary and high school enrollment of 2908 students. District III had one high school and a total school enrollment of 1170 students. The two districts had a mean private school enrollment of .7% (Bureau of the Census, 1992b).

District II was located at a distance of several states from Districts I and III and had the largest elementary and secondary enrollment. Of the 2144 students enrolled in elementary and secondary schools, 835 were White, 1282 were Black, and 27 were listed as Asian or Other. Of the 2144 students, 19% were enrolled in private schools and were excluded from this study (Bureau of the Census, 1991a).

Data Collection Procedures

After obtaining permission from district superintendents and high school principals, each senior that was present on the date of survey administration was given a survey packet, informed that participation was voluntary, and told that participation implied consent to be included in the study. Only three students refused. Students and schools were assured that students were to be identified only by numbers provided by the counselors.

Participants were presented with a packet which included Part A of the Student Opinion Inventory (National Study of School Evaluation, 1988), and a Student Questionnaire developed by the researcher to validate counseleor information and to provided answers to selected questions from the High School and Beyond study. The packet also included the Psychological Sense of School Membership (PSSM) scale (Goodenow, 1993). The testing situation was consistent across students with no attempt to survey absentees.

Class rolls of the seniors at the 8th grade level, school annuals, and student imput were used to locate dropouts from these cohorts. Evening meetings, letters, personal visits, and telephone calls were used to contact these dropouts. The researcher administered the same instruments with three additional questions:

- Why did you decide to drop out?
- What month and year did you drop out?
- Do you want me to read these questions?

Dropout response was more limited in the Appalachian area. Students who could not be reached because of heavy snow and four incarcerated dropouts were mailed surveys with the promise of a ten dollar money order for completion and return within a two week time frame. An explanatory cover letter written

by job training and adult learning personnel was included with the mailed surveys. Of the 64 surveys mailed, 18 dropouts responded. After these data were secured, counselors provided the background data for all participants. All seniors and dropouts who participated in the survey were included if adequate information could be obtained from school records.

It was hypothesized that socioeconomic status would have the largest effect on the dropout decision, and the dropout decision would vary by gender and by race. Retention would have a greater effect on the dropout decision than would excessive absences in grades 1-7. Semester academic achievement in grades 9 through 11 in English, social studies, math, and science would be the strongest predictor of remaining in school. School membership would have an inverse relationship with the dropout decision, and extracurricular activity participation would have the strongest effect on social synthesis. Academic synthesis was predicted to have the greatest effect on the dropout decision.

Results

The CHAID statistical procedure (Magidson, 1993) was used in this study to perform segmentation modeling on a sample size of 331 observations. Segmentation modeling divided the population into two distinct groups (segments) based on the dependent variable. The dropout or persisters were then split into smaller subgroups or segments that were significantly different. This splitting process continued until no statistically significant predictors (independent variables) were found or until group size limit was met. Segment size in this study was limited to $\geq$ 10 subjects. These segments were mutually exclusive and exhaustive. Each subject was represented in one segment, and segments summed across each level equaled the total number of subjects involved in the study (see Figure 2).

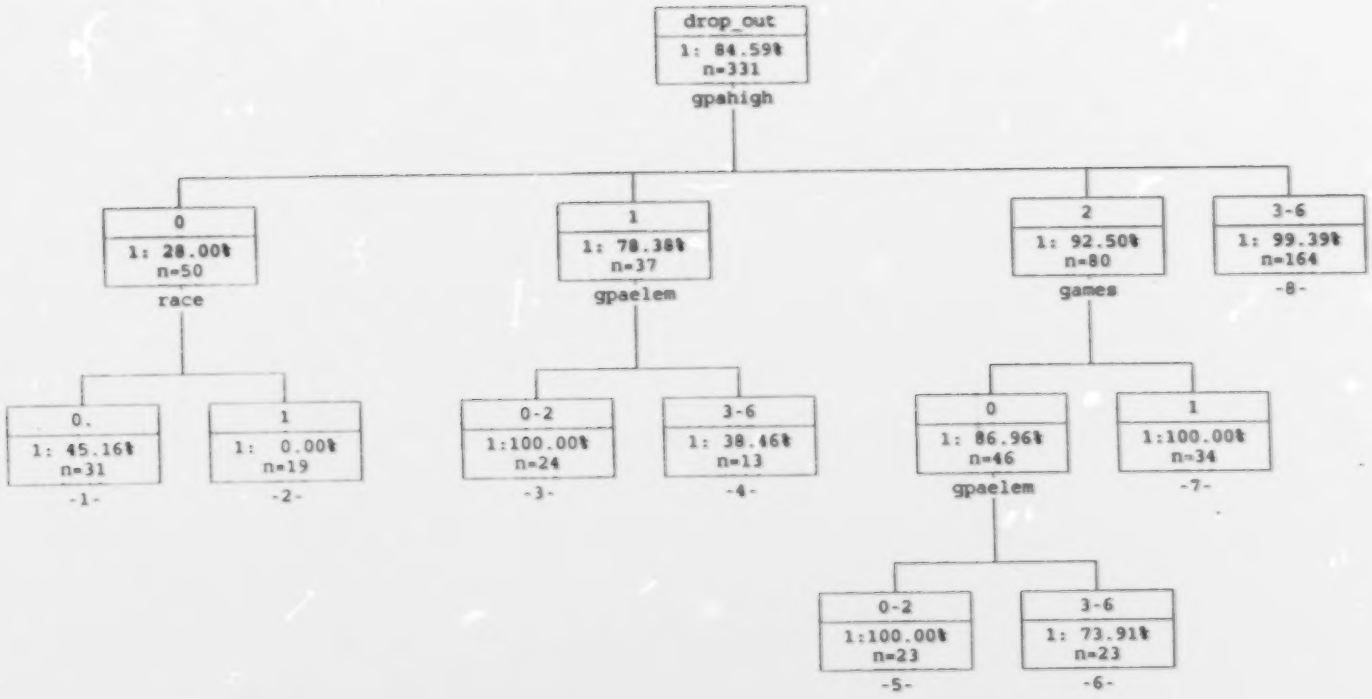

Figure 2. CHAID Tree Diagram.

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The student means of social studies, English, math, and science grades for grades 9 through 11 were entered into the model as GPAHIGH at the parent root level. In this variable (GPAHIGH) grades were ranked into 7 categories (Table 1). In the CHAID analysis, individual cells were created for Group 0, Group 1, and Group 2. Groups 3 through 6 were summed in a single cell because there was not significant difference in variability in GPAHIGH among these groups.

Table 1

Grades Ranges as Ranked in Variable GPAHIGH

Group	School grade range
0	<70
1	70 - 74.999
2	75 - 79.999
3	80 - 84.999
4	85 - 89.999
5	90 - 94.999
6	95 - 100

In GPAHIGH Group 0, in which the high school grades were less than 70, fifty students in the first branch of the CHAID tree had a 28% survival rate in high school. The next variable to enter the model at the second branch for Group 0 was race. White students with grades less than 70 had a 45% chance of graduating. Black students with grades less than 70 had no chance of graduating.

The 37 students whose grade range was 70 through 74.999 were grouped in GPAHIGH Group 1. This group had a graduation rate of 78%. At the second branch on the CHAID tree, elementary grades entered the model for Group 1. GPAELEM Groups 0 - 2, with a grade range of <70 through 79.999, showed a 100% chance of graduating from high school. Because special education students were not identified as a

subgroup in the study, it was hypothesized that this group represented the special education population. GPAELEM Groups 3 through 6, with a grade range of 80 through 100 in elementary school, showed a 38% chance of survival until graduation. THe variability among these groups were exhausted by GPAELEM and no other independent variables could enter the model.

The 80 students in GPAHIGH Group 2 (75 through 79.999 grade range) were given a 93% survival rate in high school by the CHAID analysis. The GAMES variable entered the tree at the second branch level for this group. The GAMES variable was a categorical determination of students scoring above or below the mean in extracurricular activity participation (Mean = 6). GAMES Group 0, who had participated below the mean level of involvement in six extracurricular activities in grades 7 through 12, demonstrated an 87% possibility of graduating. GAMES Group 1 who had participated above the mean of extracurricular participation, was predicted to have a 100% chance of graduation.

GAMES Group 0 was further subdivided in a third branch through elementary grades. GPAELEM Groups 0 through 2, with a grade range of <70 to 79.999 showed a 100% chance of graduating. It was hypothesized in the first such occurrence that students with low grades and a 100% survival rate represented special education students who were not identified in the study. The second occurrence in all probability has the same bias. The 23 students in GPAELEM, Groups 3 through 6, had a survival rate of 74%. Groups 3 - 6 at branch level one of the model were predicted a 99% chance of graduation.

The hypothesis that socioeconomic status would have the largest effect on the persistence/dropout decision was not supported in this study (Table 2). A structure matrix indicated that high school

Table 2

Effects of High School Achievement and Effects of Socioeconomic Factors

School achievement	Socioeconomic factors
GPASC911 = .50002	Items = -.22493
GPAE911 = .46005	MOEXP = -.19295
GPA911 = .45830	EDINFL = .18117
GPASS911 = .42436	INCOME = .14748
GPAM1911 = .38695	

achievement as determined through grades had a larger effect on the dropout/persistence decision than had the components of socioeconomic status for this rural, low socioeconomic population.

The decision to dropout varied by race but not by gender in this study (Table 3).

Table 3

Dropout by Gender

	GENDER (F) .0000	1.00 (M)
GRADS .0000	145	131
DROPOUTS 1.00	28	23
TOTALS:	52.9%	47.1%

Chi-Square	Value	DF	Significance
	.09669	1	.75584

There was no significant difference in the means of dropouts and graduates by gender. The dropout decision will vary by race was supported in the study by with a Chi-square of 38.6 p<.000 (Table 4).

Table 4
Dropout by Race

	White .00	Black 1.00
GRADS .0000	238	41
DROPOUTS 1.00	24	27
TOTAL:	79.4%	20.6%

Chi-Square	Value	DF	Significance
Pearson	38.55196	1	.00000

Retention will have a larger effect on the dropout decision than an excess of absences in Grades 1 through 7. The test of the model in Table 5 showed a polycloric correlation of .171 between excessive absences and dropout. There was a polycloric correlation of .645 between retention and dropout while excessive absences and retention have a correlation of .30.

Table 5

Retention and Excessive Absences Effects

	Correlation
EXABS vs. Dropout	.171 (PC)
RETENT vs. Dropout	.645 (PC)
RETENT vs. EXABS	.292 (PC)

Note. PC = polycloric correlation; a correlation between dichotomous and categorical variables.

Academic achievement in English, social studies, math, and science in grades 9 - 12 was the strongest predictor of remaining in school until graduation. Students with a mean score of 80 or above for semester grades were predicted to remain until graduation.

Participation in extracurricular activities had the strongest effect on social synthesis. This participation influenced only students who had high school grades in the 75 through 79.999 range and was the only predictor of social synthesis to enter the model.

That academic synthesis would have a stronger influence on the dropout or graduation decision than would social synthesis was supported. Academic synthesis in the form of high school grades entered the CHAID model on the first segmentation. Social synthesis in the form of extracurricular participation entered at the second segmentation level and only for those whose GPAHIGH ranged from 75 to 79.999.

School membership was hypothesized to have an inverse relationship with the dropout or graduation decision. The higher the feelings of school membership for the individual student, the lower would be the probability of that student leaving school before graduation (Table 6).

Table 6

ANOVA: Membership and Dropout

Source	DF	Sum of Squares	Mean Squares	F Ratio	F Prob
Between Groups	1	10.9181	10.9181	23.9336	.0000
Within Groups	314	143.2418	.4562		
Total	315	154.1599			

Group	Count	Mean	SD	SE	95% Confidence Int.
0 (Grads)	265	3.5379	.6665	.0409	3.4573 to 3.6186
1	51	3.0327	.7205	.1009	2.8300 to 3.2353

This hypothesis was supported. Group means of scores on the Psychological Sense of School Membership (PSSM) differed for graduates and dropouts with the graduates having the higher scores. The confidence intervals at the 95% level did not touch or overlap.

Discussion

The purpose of this study was the application of Tinto's model (1975, 1987) of college attrition to rural, low socioeconomic public school settings in the southeastern United States to develop a predictor model for identifying high school students in danger of dropping out of school. High school academic performance was the dominate variable to predict dropouts. Through use of the CHAID model it was found that students at different levels of academic achievement have unique identifying characteristics. It is suggested that targeting the various subgroups' specific needs would be more effective in dropout prevention than a blanket program for the total high school population. While the literature names high school grades as an important predictor, the dominance of this variable suppresses additional information necessary for the educator to remediate the needs of students at different levels of achievement. The CHAID model allows a statistical approach to revealing secondary influences which could hold the student in high school toward the goal of graduation.

The CHAID explanatory model identified academic achievement as the most important determinant of the rural high school student's persisting or drop out behavior. Prior studies by Bachman, Green, &

Wirtanen, 1971; Cervantes, 1965; Ekstrom et al., 1986; Tinto, 1975; Wehlage & Rutter, 1986; Weis, Ferrer, & Petrie, 1989 support this finding of the necessity of academic integration. The job of school is teaching and learning which is measured by students' grades and provides no surprises for the high school educator. Additional information is needed to appropriately attack the dropout dilemma.

More interesting and explanatory are the variables which entered the CHAID model at the subgroup levels of GPAHIGH. Each subgroup was further explained by different variables which characterized that specific group. These unique characteristics per each subgroup could guide educators toward more specific remediation and academic and social assistance rather than an overall dropout prevention program for the whole high school population.

In this study race was a dropout predictor for students with GPAHIGH below 70%. Black students appeared to be handicapped by a school and curriculum structured for a White, middle class population (Asante, 1991; Brady, Tucker, Harris, & Tribble, 1992; Fordham & Ogbu, 1986; Rist, 1970).

For students whose GPAHIGH fell between 70% and 75%, elementary grades were the next significant predictor of persistence/dropout behavior. The researchers suggest that results were confounded by the special education population. Due to confidentiality laws the researchers were not permitted to identify students receiving special services. Students with grades below 80% in elementary school had 100% survival rate to graduation while those with elementary grades at or above 80% had only a 38% survival rate in high school. It is suggested by the researchers that these students with elementary grades at or above 80% would benefit greatly from intervention programs. It is recommended in future studies that special education students be identified and their data be treated seperately. Also, a larger sample size could further clarify this confounding issue.

For students whose GPAHIGH mean ranged from 75% to 80%, participation in extracurricular activities (GAMES) was the best predictor of persistence. Students who participated at or above the mean (≥ 6) in high school clubs, sports, and/or organizations had a 100% survival rate for graduation while those below the mean had a survival rate of 86%. The below mean GAMES cell was further segmented by GPAELEM. Students with elementary grade averages below 80% had a 100% graduation rate. Again, the researchers suggest confounding of the results by the inability to identify the special education population.

-/2-

To further clarify the influence of extracurricular participation, it is recommended that GAMES be weighted by the participation hours required, and whether or not the extracurricular activities required after school practice time or during school club periods. A student who participated in three sports would be below the mean for GAMES but would actually spend more practice hours than a student participating above the mean in activities that were held during school club periods. State "No Pass - No Play" laws and lack of adequate after-school transportation appear to negatively affect the below the mean GAMES subgroup. After-school transportation was provided for students in District II and' participation in sports, band, cheerleading, and vocational clubs was more than twice as much as those students in Districts I and III.

The CHAID exploratory model has presented cautions to educators that treating the rural, low socioeconomic, high school populations as a single entity is inappropriate. Students at different academic levels have unique needs which should be addressed with specific remediation measures within the overall dropout prevention program. Students' whose academic performance places them in the middle continuum of high school grades have the greatest variability in making the drop out decision. It is with these students that educators need to enhance school involvement opportunities.

Hypotheses for this study were based on the literature search. That socioeconomic status would have the greatest effect on the persistence/droupout decision (Ekstrom et al., 1986; Fine, 1986; Mann, 1986) was eliminated by restriction of range. All study Districts were of low socioeconomic status. Median family incomes ranged from $14,745 to $19,097 and the percentages of families below the poverty level ranged from 20% to 40% (Bureau of the Census, 1991b; Bureau of the Census, 1992a; Bureau of the Census, 1992b; Georgians for Children, 1992). Findings in this study indicated that many children managed to overcome this handicap and perform adequately in school. In contrast, the children who had already dropped out of this cohort support the findings in the literature. This questions the current direction of high school dropout research. Instead of defining characteristics of dropouts, researchers may learn more by examining characteristics of persisters in rural low socioeconomic communities and integrating these motivations into dropout prevention programs.

The dropout decision did not vary by gender. Pallas (1984/1985), in his study of the effects of early assumption of adult roles on dropouts, found males adversely affected by early work experience and females negatively affected by early childbearing. Although both the Appalachian and the Black subcultures involved

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in this study appear to accept the early assumption of adult roles through teenage marriage and childbearing (DeYoung, 1994; McMillen & Reed, 1994), female and male dropout rates were not significantly different.

The effect on race shown in this study indicated the probable consequences of schools that were structures for a White, middle-class population (Finn, 1989; Fordham & Ogbu, 1986; Giroux, 1983). It also raises the questions of over representation of minority groups in special education populations and the past failures of schools in educating minority populations (Calabrese, 1988; Giroux, 1983; Pallas, Natriello, & McDill, 1989; Rist, 1970).

Retention did have a larger effect on the dropout decision that did excessive absences. Retention in grades one through seven correlated at 65% with the Dropout/Persister variable, while excessive absences had only a 17% correlation with retention. Retention nor excessive absences entered the CHAID model. The CHAID variable GPAHIGH segment below 70% would indicate the retained student. For this group 100% of the Black students and 55% of the White students did not graduate. Due to all the variability being absorbed by GPAHIGH, retention could not enter the model, but is implied by failing grades.

Summary

The purpose of this study was the application of Tinto's model (1975, 1987) of college attrition to rural, low socioeconomic public school settings in the southeastern United States to develop a predictor model for identifying high school students in danger of dropping out of school. Through use of the CHAID model it was found that although the dominate variable to predict dropouts was high school academic performance, students at different levels of academic achievement have unique identifying characteristics.

Five hypotheses were supported. Retention was found to have a larger effect on dropping out than did excessive absences. Academic achievement in high school was the strongest predictor of remaining in school. Participation in extracurricular activities had the strongest effect on social synthesis. Academic synthesis had a stronger effect on persistence in school than did social synthesis. School membership was found to be inversely related to dropping out. Although the dropout decision was found to vary by race, it was not found to vary by gender. Because of the range restriction of limiting the study to low socioeconomic areas, socioeconomic status was not found to have the largest effect on the decision to drop out of school before graduation. Therefore, this hypothesis was not supported.

It is suggested that targeting the various subgroups' specific needs would be more effective in dropout prevention than a blanket program for the total high school population. The CHAID model allows a statistical approach to revealing secondary influences which could hold the student in high school toward the goal of graduation. Therefore, Tinto's model (1975, 1987) with modifications is appropriate for use with rural, low socioeconomic public schools in the southeastern United States. In future research, with the addition of cut points for the independent variables, and data from early in the school experience, this model may be validated as a predictor model for this setting.

Exploratory Study

Several issues concerning possible confounding of the data set prompted the researchers to conduct an exploratory study limited to the data of District II. These concerns were cultural heterogeneity of the school districts, and limitations of collection of dropout data from Districts I and III resulting in an over representation of dropouts from District II. Though the literature emphasizes the importance of high school grades as the best predictor of academic integration and the dropout decision, the researchers believed that much predictor information remained hidden due to the predictor variability being exhausted by high school grades. Also, to create a predictor model designed to assist educators in remediating dropout characteristics in the early high school years before the dropout decision is made relying on cummulative high school grades is inappropriate. They do not yet exist.

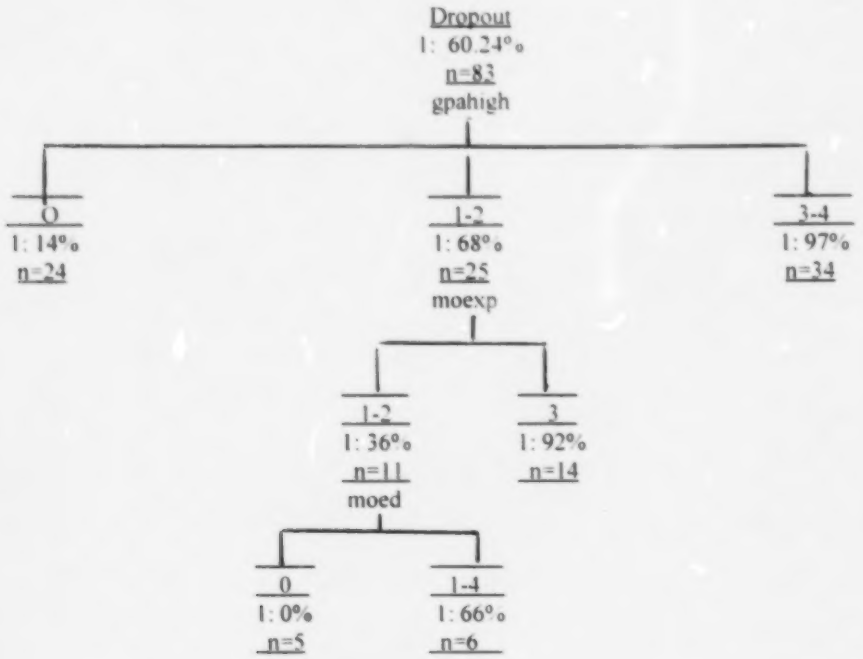
Cultural heterogeneity between the rural Appalachian population of District I and III and the rural agrarian population of District II has previously been sited. The data collector/researcher 's belief that the Appalachian population's self-reporting of socioeconomic indicators were over estimated was supported by local educators who knew the student's true condition. In search of Appalachian dropouts the data collector/researcher mailed out the questionnaires with the promise of a $10.00 money order if the material was returned by a certain date. The poor response resulted in only 18 money rewards being given. With the rural agrarian population the reluctance to report and to report truthfully was not observed. Due to the scarcity of Appalachian dropout response the data set was skewed with a disproportionate number of dropouts from the rural agrarian population . For these reasons the researchers determined that an exploratory study of District II was merited.

Results

CHAID Tree Diagram (Full Model): District II. The CHAID analysis was conducted with all variables included in the original full model. The CHAID model of District II supported the full model finding that only GPAHIGH representing subgroups one and two, the marginal grades students, could be further segmented to indicate the predictor variables mother's expectations and mother's education which influenced their stay-in/dropout decision. This finding is supported in the literature by Cervantes (1965), Dorrell (1993), Ekstrom et al. (1986),Kaufman et al. (1992), Rumberger (1983), and Tinto (1975) Variability for the other GPAHIGH subgroups was depleted. Mother's expectations and mother's education depleted the available variability preventing GAMES,

extracurricular activities, from entering this data restricted model.

Figure 1. CHAID Tree Diagram for District II



CHAID Tree Diagram (Without GPAHIGH and GPAELEM): District II. To justify the exclusion of academic performance because of its confounding influence, bi-serial correlations were run on the two variables' relationship with the dropout decision. GPAHIGH had a - 8105 correlation with the dropout decision at the p < .0000 level of significance. GPAELEM correlated at -.5148 with the dropout decision at the p< .000 level of significance. The researchers are supported in their belief that academic performance and the dropout decision variables shared variability to the point of exclusion of other variables which could give predictor information. Figure 2 is the CHAID Tree Diagram resulting when GPAHIGH and GPAELEM were withheld from the model. Mother's expectation entered on the first node. Mother's education further segmented the model. The child had no chance of graduating from high school if the mother had not graduated, even if she expected the child to graduate. Extracurricular participation, games, was the second node for mother's who expected their child to go to technical school or college. For students participating below the mean in games mother's education entered on the third node

Students who participated in extracurricular activities below the mean had a 30% change of graduating even though their mothers did not graduate from high school. If their mothers had graduated from high school or better the students had a 82% survival rate until graduation.

Figure 3 is the CHAID tree diagram with GPAHIGH excluded from the model, but includes GPAELEM. This predictor variable, GPAELEM, exhausts the variability preventing any other predictors from entering the model. It is suggested by the researchers and supported in the literature that elementary grades are a part of early school experiences and have strong intercorrelations with other variables left in the model. Consequently, no further individual variables have the predictor power to achieve significance.

Figure 2. Limited CHAID Tree Diagram for District II

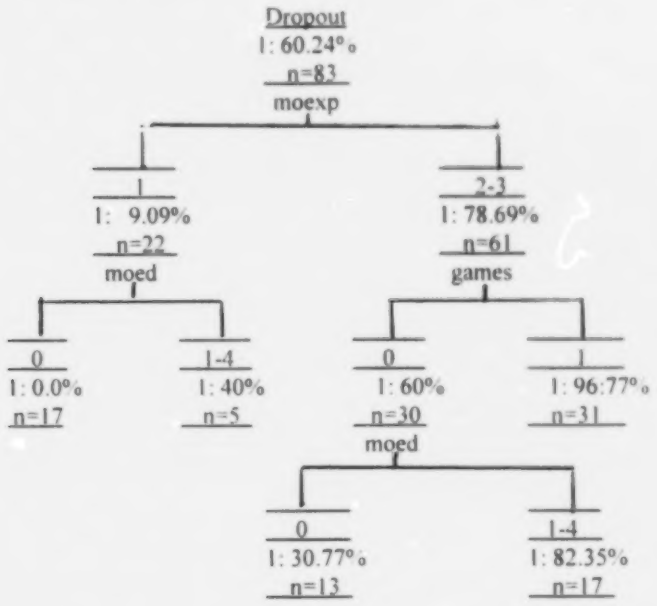
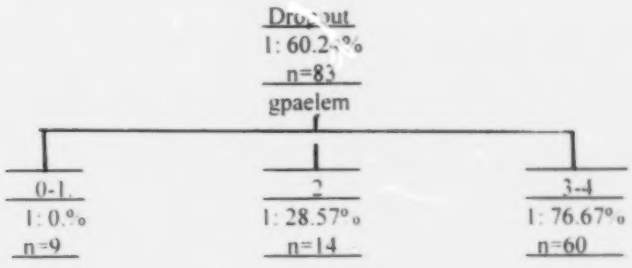


Figure 3. CHAID Tree Diagram (Without GPAHIGH) for District II



To test the agreement of the strength of the CHAID predictor variables a stepwise logistic regression of the full model for District II was run. Entering first was mother's expectation accounting for 88% of the variability. Second to enter was memcat, the categorical variable for feelings of school membership. The third and last variable to enter was father's occupation. These three variables allowed correct identification of 92% of the sample in the model. The classification table is shown in figure 4.

Figure 4. Logistic Regression Classification Table of Model Prediction of Dropouts

		Predicted		
		Grad	Dropout	
Observed				
	44		2	95.65%
	4		27	87.10%
				92.21%

Predictor variables were entered into the logistic regression either as continuous or categorical. Father's occupation was dummy coded as required for the CHAID procedure into categories with zero representing no occupation, deceased, and etc through seven representing executives and proprietors of large concerns and major professionals (Hollingshead and Redlich, 1958). This variable was entered into the logistic regression as categorical which resulted in weights being assigned to each level of the dummy coding. Weights assigned to codes 0-2 and 4-7 were of no consequence. A weight of 4.17 which is approximately 10 times the weight assigned to the variables mother's expectation and feelings of school membership was assigned to father's occupation category 3, skilled laborer. All 25 subjects in this category had 0% chance of graduating high school. This information would not have been evident if father's occupation had been a continuous variable.

To investigate this result additional statistics were run. Figure 4 is the frequency table for father's occupation. The Pearson r for the total of levels of father's occupation and the dropout decision was -.190. To question if the father's occupation variable was influenced by the single parent household variable a Pearson r of -.204 was obtained. In figure 5, a crosstabulation of father's occupation with single parent household, it was revealed that twice as many students (16) lived in the home with two parents than those who were in one parent homes (8). In this sample variable category of father's occupation being from a two parent home was not influential in keeping the

student in school as predicted in the literature. A crosstabulation of gender and fathers' occupation identified 15 females and 9 males whose fathers held skilled laborer jobs (Figure 6). Additional examination of the sample data revealed no gender or single parent/two parent household influence to explain the father's occupation skilled laborer category results.

Figure 4. Frequency Distribution of Father's Occupation by Hollingshead Categories

FAOCC1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	00	7	8.4	8.5	8.5
	1.00	18	21.7	22.0	30.5
	2.00	22	26.5	26.8	57.3
	3.00	25	30.1	30.5	87.8
	4.00	8	9.6	9.8	97.6
	5.00	1	1.2	1.2	98.8
	6.00	1	1.2	1.2	100.0
	Total	82	98.8	100.0	
Missing	System Missing	1	1.2		
	Total	1	1.2		
Total		83	100.0		

Figure 5. Crosstabulation of Father's occupation with Single Parent

FAOCC1 * SINGPAR Crosstabulation

Count

		SINGPAR		
		00	1.00	Total
FAOCC1	00	3	4	7
	1.00	7	11	18
	2.00	10	12	22
	3.00	16	8	24
	4.00	4	4	8
	5.00	1		1
	6.00	1		1
Total		42	39	81

Figure 6. Crosstabulation of Gender and Father's Occupation

GENDER * FAOCC1 Crosstabulation

Count

		FAOCC1							Total
		00	1.00	2.00	3.00	4.00	5.00	6.00	
GENDER	00	3	10	10	15	3	1	1	43
	1.00	4	8	11	9	4			36
Total		7	18	21	24	7	1	1	79

Exploratory Study Discussion

An exploratory study of data from the rural agrarian sample of District II was conducted to avoid the cultural heterogeneity of the total sample, and to eliminate the probable skewness of the obtainable dropout data. The literature states academic achievement as the strongest predictor of the dropout decision. This hypothesis is strongly supported in the main study. To create a predictor model high school grades can not be a variable as they do not yet exist. This exploratory study searched for underlying variables to explained the dropout decision.

The full model CHAID tree diagram for District II supported the findings in the main study. High school grades were the best predictor of the dropout decision. This is logical as high school grades have a -.8105 correlation with the dropout decision and elementary grades have a -.5148 correlation. Only for the marginal students, high school grades between 70% and 80%, was the additional variables of mother's expectations and mother's education allowed to enter the model as predictors. When grades variables for both high school and elementary school were withheld from the CHAID model, mother's expectation and education and student participation in extracurricular activities became predictors. When elementary grades, but not high school grades, were allowed in the model, no additional variables were designated as predictors. It is suggested by the researchers that elementary grades are highly interrcorrelated with other early school experiences to the extent that no other variables were significant.

In a stepwise logistic regression analysis of District II data only three variables, mother's expectation, feelings of school membership, and father's occupation were entered to model. These allowed for a 92% correct classification of the dropout decision. Of particular note is the father's occupation category 3, skilled laborer. All twenty-five students whose father was a skilled labor dropout out of high school. In additional examination of the

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variable no explainable relationship was found with the single parent nor the gender variable. The dropout indicators named in the logistic regression analysis represent the influence of the mother, influence of the father, and the students relationship with school. For the District II sample this appears to be the best predictor model.

Recommendations. It appears that rural, low socioeconomic populations are culturally diverse and that regional school districts would do best in creating area specific treatments to supplement their dropout prevention programs. The influence of the mother's expectations for her child and the her educational background has been demonstrated in all the analyses of the data. Parenting education and a greater effort by the school district for inclusion of the parents in the child's education emerge as important factors for holding the at-risk student in school until graduation. Waiting until the high school student demonstrates his or her drop potential through low and/or failing grades may be too late to rescue the student from dropping out. Drop out prevention programs should begin treatment for the student prior to his or her having the opportunity to fail academically.

Limitations. As in all exploratory research cautions that the results may be sample specific should be observed. It is obvious that cultural diversity of the total sample from the two states obscured the potential of variables to emerge as predictors. This observation by the researchers prompted this exploratory study.

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APPENDIX

Variable Labels and Measurements

Race	RACE	0 = White, 1 = Black
Gender	GENDER	0 = female, 1 = male
Retention	RETENT	0 = none, 1 = yes
Free Lunch Eligibility	FREELUN	0 = no, 1 = yes
More than 2 siblings	SIB≥2	0 = no, 1 = yes
Single parent home	SINGPAR	0 = no, 1 = yes
Items lacking in home	ITEMS	0 - 9; 0 = none lacking
Excessive Absences ≥18 abs per yr - no credit	EXABS	0 - none, 1 = 1 year...
High School academic achievement	GPA911	Mean of semester averages (9 - 11 grades): GPAE911 (English) GPASS911 (Social Studies GPAM911 (Math) GPASC911 (Science)
Mother's Expectations	MOEXP	0 = < high school 1 = high school graduate 2 = 2 yrs. post-secondary 3 = college
Mother's Education	MOED	0 = < high school, don't know 1 = high school graduate 2 = < 2 yrs. post-secondary 3 = > 2 yrs. post-secondary 4 = college graduate
Father's Education	FAED	Score as MOED
Trouble with the law	LAW	0 = false; 1 = true
Popularity, peer interactions	POP	0 = true, 1 = false

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Mother's occupation	MOOCC	Rank order; 7 = high; 0 = unemployed occupational scale from Hollingshead & Redlich, 1958
Father's occupation	FAOCC	See Mother's occupation
Extracurricular activities	EXCURR	# of activities 1-12
Extracurricular activities: above or below mean	GAMES	Mean = 6 ≥ 6 = 1, < 6 = 0
Adult Interactions	ADNACT	Mean of SOI subscales I7-I19, I21, I30, I37
School Membership	MEMBER	Mean of PSSM M1-M18
School Membership: above or below mean	MEMCAT	≤ 3 on PSSM = 0 3.001 - on PSSM = 1
Academic achievement in elementary grades	GPAELEM	Mean of academic achievement in 7th grade: GPAE7 (English) GPASS7 (Social Studies) GPAM7 (Math) GPASC7 (Science)
Parental education	EDINFL	Use the higher of MOED, FAED
Income	INCOME	MOOCC or FAOCC whichever highest
High school grades by categories	GPAHIGH	Level School Grades 0 <70 1 70 - 74.999 2 75 - 79.999 3 80 - 84.999 4 85 - 89.999 5 90 - 94.999 6 95 - 100

Socioeconomic status	SES	mean of ITEMS, INCOME, FAOCC, MOOCC, and MOEXP

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